



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/511,404

10/12/2004

Xianming Tian

7902/3

9904

27774

7590

06/13/2006

MAYER & WILLIAMS PC  
251 NORTH AVENUE WEST  
2ND FLOOR  
WESTFIELD, NJ 07090

EXAMINER

TALBOT, MICHAEL

ART UNIT

PAPER NUMBER

3722

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/511,404

Applicant(s)

TIAN ET AL.

Examiner

Michael W. Talbot

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/12/04.05/24/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “upper bearing ring and lower bearing ring having the same external dimensions and surface structures” recited in claim 9 and the “upper bearing ring and lower bearing ring having different external dimensions and surface structures, including the inside diameter and the thickness of the bearing rings” recited in claim 10 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The disclosure is objected to because of the following informalities:

Art Unit: 3722

Refer to page 4, paragraph 10, description of Fig. 4C is missing the appropriate Figure. This paragraph should be deleted or Fig. 4C must be provided with response to Office Action.

Appropriate correction is required.

### ***Claim Objections***

3. The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

4. Claim 1 recites the limitation "the surface" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 recites the limitation "the surface" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the outer peripheral surface" in lines 5 through 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the front end surface" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "the thickness" in line 7. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted

Art Unit: 3722

structural cooperative relationships are seen in the mere listing of elements in claims 1 and 3 without providing the required structural relationship between the individual elements.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1,5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Huff et al. '194. Huff et al. '194 shows in Figures 2A through 5B a keyless chuck comprising a rear sleeve (12), a body (15), a bearing ring (50), a bearing assembly (48), a nut (13), a jaw (14), a front sleeve (11) and a stopper wherein the front sleeve engages the nut through radial smooth press-fit (col. 3, lines 19-20) and wherein the surface of the bearing ring facing the bearing assembly is provided with a recessed circumferential arcuate race (54) and a plurality of ball-shape grooves (56) uniformly formed in an arcuate bottom surface of the arcuate race. Huff et al. '194 shows the front sleeve being press-cast using a press-cast metal or powdered metallurgic material (col. 3, lines 20-24). Huff et al. '194 shows the number of ball-shaped grooves being 24.

9. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Huff et al. '275. Huff et al. '275 shows in Figures 1 and 3 a keyless chuck comprising a rear sleeve (110), a body (20), a bearing ring (80), a bearing assembly (70), a nut (40,60), a jaw (30), a front sleeve (50) and a stopper (120) wherein the front sleeve engages the nut through radial smooth press-fit (col. 2, lines 66-68) and wherein the surface of the bearing ring facing the bearing assembly is provided with a recessed circumferential arcuate race (84) and a plurality of ball-shape grooves (84b) uniformly formed in an arcuate bottom surface of the arcuate race. Huff et

Art Unit: 3722

al. '275 shows the front sleeve being press-cast using a press-cast metal or powdered metallurgic material (col. 5, lines 38-41).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '194. Huff et al. '194 does not disclose expressly that the nut is provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°. Instead, Huff et al. '194 is silent as to the specific construction of the split nut. At the time of the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to select "a nut is provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" because Applicant has not disclosed that a "nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the keyless chuck of Huff et al. '194, and Applicant's keyless chuck to perform equally well with either the non-specific split-nut construction as taught by Huff et al. '194 or the claimed "nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" because both split-nut constructions would provide the direct,

Art Unit: 3722

positive link between rotary movement of the front sleeve and the complementary threaded jaws so as to open and close them.

Furthermore, Applicant does not provide any criticality or unexpected results for "the nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" as recited in claim 2.

12. Claims 3 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Huff et al. '194 in view of Jordan et al. '317. Huff et al. '194 lacks the presence of a lower bearing ring having different external dimensions and surface structures than the upper bearing ring. Jordan et al. '317 shows in Figures 1,3 and 4 a keyless chuck comprising a upper bearing ring (100), a bearing assembly (90) and a lower bearing ring (80) having different external dimensions and surface structures than the upper bearing ring. In view of this teaching of Jordan et al. '317, it would have been obvious to one of ordinary skill in the art to modify the keyless chuck of Huff et al. '194 to include a lower bearing ring as taught by Jordan et al. '317 to form a bearing cage assembly, thus simplifying the nut design by eliminating the recess from the nut surface and making it easier and less expensive to replace the bearing assembly when needed.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '194. Huff et al. '194 does not disclose expressly that (1) the nut is provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75° and (2) the nut is provide with two parallel angularly-cut surfaces symmetrically formed on an outer surface of the nut which extends downwards in an axial direction from a front end surface of the nut by one third of a thickness of the nut being located at an angle of 90°. Instead, Huff et al. '194 is silent as to the specific construction of the split nut. At the time of the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to select "(1) nut provided with two angularly-cut

Art Unit: 3722

split notches symmetrically positioned on both ends of a diameter having a cut-out angle between  $30^{\circ}$  and  $75^{\circ}$  and (2) nut provided with two parallel angularly-cut surfaces symmetrically formed on an outer surface of the nut which extends downwards in an axial direction from a front end surface of the nut by one third of a thickness of the nut being located at an angle of  $90^{\circ}$  because Applicant has not disclosed that "(1) a nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between  $30^{\circ}$  and  $75^{\circ}$  and (2) a nut provided with two parallel angularly-cut surfaces symmetrically formed on an outer surface of the nut which extends downwards in an axial direction from a front end surface of the nut by one third of a thickness of the nut being located at an angle of  $90^{\circ}$ " provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the keyless chuck of Huff et al. '194, and Applicant's keyless chuck to perform equally well with either the non-specific split-nut construction as taught by Huff et al. '194 or the claimed "(1) nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between  $30^{\circ}$  and  $75^{\circ}$  and (2) nut provided with two parallel angularly-cut surfaces symmetrically formed on an outer surface of the nut which extends downwards in an axial direction from a front end surface of the nut by one third of a thickness of the nut being located at an angle of  $90^{\circ}$ " because both split-nut constructions would provide the direct, positive link between rotary movement of the front sleeve and the complementary threaded jaws so as to tighten and loosen the jaws about an drill bit.

Furthermore, Applicant does not provide any criticality or unexpected results for "(1) a nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between  $30^{\circ}$  and  $75^{\circ}$  and (2) a nut provided with two parallel angularly-cut surfaces symmetrically formed on an outer surface of the nut which extends



Art Unit: 3722

downwards in an axial direction from a front end surface of the nut by one third of a thickness of the nut being located at an angle of 90° as recited in claim 4.

14. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '194. Huff et al. '194 discloses the claimed invention except for (1) the recessed circumferential arcuate race has an arc radius from 1.5 to 2.5 mm and a depth from 0.05 to 0.3 mm and (2) the ball shaped grooves have a spherical radius from 1.0 to 2.0 mm and a depth from 0.01 to 0.1 mm which have been selected for optimization (col. 5, lines 21-26). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to vary the individual dimensions to match the specific application because it has been held that discovering an optimum value of a result effective variable involves only routine experimentation.

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '194 in view of Jordan et al. '317. Huff et al. '194 in view of Jordan et al. '317 does not disclose expressly that the upper and lower bearing rings are identical in external dimensions and surface structure. Instead, Huff et al. '194 in view of Jordan et al. '317 shows the upper and lower bearing rings being different in external dimensions and surface structure. At the time of the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to select "the upper and lower bearing rings being identical in external dimensions and surface structure" because Applicant has not disclosed that a "the upper and lower bearing rings being identical in external dimensions and surface structure" provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the keyless chuck of Huff et al. '194 in view of Jordan et al. '317, and Applicant's keyless chuck to perform equally well with either the different external dimensions and surface structures as taught by Huff et al. '194 in view of Jordan et al.

Art Unit: 3722

'317 or the claimed "upper and lower bearing rings being identical in external dimensions and surface structure" because both bearing ring assemblies would provide the required rotational movement to tighten and loosen the chuck jaws.

Furthermore, Applicant does not provide any criticality or unexpected results for "the upper and lower bearing rings being identical in external dimensions and surface structure" as recited in claim 9.

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '275. Huff et al. '275 does not disclose expressly that the nut is provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°. Instead, Huff et al. '275 is silent as to the specific construction of the split nut. At the time of the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to select "a nut is provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" because Applicant has not disclosed that a "nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the keyless chuck of Huff et al. '275, and Applicant's keyless chuck to perform equally well with either the non-specific split-nut construction as taught by Huff et al. '275 or the claimed "nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" because both split-nut constructions would provide the direct, positive link between rotary movement of the front sleeve and the complementary threaded jaws so as to open and close them.

Art Unit: 3722

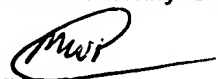
Furthermore, Applicant does not provide any criticality or unexpected results for "the nut provided with two angularly-cut split notches symmetrically positioned on both ends of a diameter having a cut-out angle between 30° and 75°" as recited in claim 2.

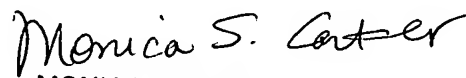
17. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huff et al. '275. Huff et al. '275 discloses the claimed invention except for (1) the recessed circumferential arcuate race has an arc radius from 1.5 to 2.5 mm and a depth from 0.05 to 0.3 mm, (2) the number of ball-shaped grooves ranging from 20 to 80, and (3) the ball shaped grooves have a spherical radius from 1.0 to 2.0 mm and a depth from 0.01 to 0.1 mm. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to vary the dimensional specifications and number of grooves so as to match the specific application/intended use because it has been held that discovering an optimum value of a result effective variable involves only routine experimentation.

### *Conclusion*

18. Any inquiry concerning the content of this communication from the examiner should be directed to Michael W. Talbot, whose telephone number is 571-272-4481. The examiner's office hours are typically 8:30am until 5:00pm, Monday through Friday. The examiner's supervisor, Mrs. Monica S. Carter, may be reached at 571-272-4475.

In order to reduce pendency and avoid potential delays, group 3720 is encouraging FAXing of responses to Office Actions directly into the Group at FAX number 571-273-8300. This practice may be used for filling papers not requiring a fee. It may also be used for filing papers, which require a fee, by applicants who authorize charges to a USPTO deposit account. Please identify Examiner Michael W. Talbot of Art Unit 3722 at the top of your cover sheet.

  
MWT  
Examiner  
5 June 2006

  
MONICA CARTER  
SUPERVISORY PATENT EXAMINER